

REVISION OF THE INTERTIDAL ALEOCHARINE GENUS *TARPHIOTA* (COLEOPTERA: STAPHYLINIDAE)^{1, 2}

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ABSTRACT: A systematic revision of the genus *Tarphiota* is presented. *Tarphiota* Casey is re-described. *Tarphiota fucicola* and *T. geniculata* are re-described. *Tarphiota pallidipes* synonymized under *T. fucicola*. Lectotype and paralectotypes are designated for *T. pallidipes*, *T. debilicollis*, *T. hirsutula*, *T. iota*, *T. insolita*, *T. litorina*, and *T. seditiosa* from Casey's syntype series deposited in the NMNH. A key is provided for separation of the known species of *Tarphiota* and illustrations of diagnostic features are presented.

Members of the genus *Tarphiota* Casey are confined to the sandy beaches of Pacific North America. *Tarphiota* was first described and characterized by Casey in 1893. Mäklin (1852) described *Tachyusa fucicola* and *Homalota geniculata* from the coast of Alaska. *Tachyusa fucicola* was transferred to *Homalota* Mannerheim by Mäklin in 1853. Casey (1893) described the new genus and species *Tarphiota pallidipes* from the coast of California. He believed that the genus *Tarphiota* included *H. fucicola* and *H. geniculata*. Later, Casey also described six additional species from the Pacific coast of America. However, all six species were synonymized by Fenyés in 1920 and *T. pallidipes* is synonymized under *T. fucicola* in this paper.

Examination of the type series of *T. fucicola* (Mäklin) and *T. geniculata* (Mäklin) in the collections of the Finnish Museum of Natural History allowed me to revise this genus. In this paper, I re-describe *Tarphiota* Casey and the two valid species [*T. fucicola* (Mäklin), *T. geniculata* (Mäklin)], synonymize *Tarphiota pallidipes* Casey under *Tarphiota fucicola* (Mäklin), and designate lectotypes and paralectotypes from the syntype series of each described species in the collections of the NMNH.

Tarphiota Casey

Tarphiota Casey, 1893: 332, 1910: 74; Fenyés, 1920: 254; Bernhauer and Scheerpeltz, 1926: 596; Blackwelder, 1952: 374; Hatch, 1957: 145; Moore and Legner, 1975: 489, 1976: 535; SeEVERS, 1978: 132.

Diagnostic Combination. Among aleocharine genera with 4-5-5 tarsal formula, members of *Tarphiota* are recognized by the combination of: integument

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of head, pronotum, and elytra granulose due to a fine-meshed, raised reticulation; antennomeres (Fig. 1) 8-10 transverse; head without infraorbital carina; mandible (Fig. 4) with blunt apex; labium (Fig. 6) with narrow Y-shaped ligula; mentum with long v seta; separated mesocoxae; pointed mesosternal process; unmarginated mesocoxal cavities; anterior and middle tibiae with a row of spines; elytra slightly sinuate apico-laterally, longer than pronotum; hind wings present; and internal circular sclerites present at base of metasternum.

Description. Small, length 2.0-3.1 mm. Body shape narrow, flattened and parallel-sided. Body color black or dark brown. Microsculpture of head, pronotum, and abdominal segments faintly polygonal. Integument of head, pronotum, and elytra granulose due to a fine-meshed, raised reticulation, more or less uniformly pubescent with short microsetae.

HEAD. Slightly deflexed, ≈ 1.2 times as wide as long. Eyes with microsetae between facets, ≈ 0.5 times as long as tempora. Neck absent but basal constriction present. Infraorbital carina absent. Microsetae relatively long, directed anteriorly, almost uniformly distributed. Integument granulose. Hexagonal microsculptures present. Tempora short. Submentum with several setae and punctures. Antenna (Fig. 1) with 11 antennomeres, slightly incrassate towards tip; antennomeres 2-3 each shorter than preceding, 4-7 gradually dilated, 8-10 transverse.

MOUTHPARTS. Labrum (Fig. 2) transverse, 9+9 major setae distinct, 3+3 additional setae present, sensillae present, punctures distributed anteriorly. Epipharynx (Fig. 3) with about 6-8 lateral pores on each side, numerous tiny pores, about 6-8 pores on apical region, about 35 pores on median region along with numerous indistinct pores. Mandibles (Fig. 4) asymmetrical, apex blunt and curved downward; right mandible with median tooth, absent from left mandible; serration absent from apex to median tooth, many punctures scattered ventrally and dorsally; prostheca well developed, membranous with fibrils. Maxilla (Fig. 5) with galea and lacinia elongate; galea with inner surface membranous, apex with long filiform setae, outer surface corneous, apex with numerous delicate branching fibrils which have a row of extremely delicate setae; lacinia more or less acute, internal surface with comb composed of a single row of 9 well separated spines followed more proximally by a small dense patch of setae, and a distinct row of numerous setae, a row of pores on dorsal surface; maxillary palpus, robust, with 4 articles, article 3 incrassate distally and longer than article 2, article 4 very slender, narrow distally with filamentous sensilla. Labial palpi (Fig. 6) with 3 articles, elongate, article 3 shorter than article 1 and longer than article 2, article 3 incrassate distally; ligula bifid, 2 tubercles on tip; a pair of medial setae, twin pores, median pores, distal pores, setal pores, real pores, basal pores present, and about 30-35 or 5 pseudopores present medially, 11-12 or 3 laterally. Prementum with a pair of comb-like hypoglossae. Mentum almost trapezoidal, slightly emarginate anteriorly, three main setae present on each side, v setae relatively long, several setae and punctures present.

THORAX. Pronotum $\approx 1.2-1.3$ times as wide as long, basal and apical lines about equal in length, sides round; microsetae uniformly distributed; macrosetae absent; integument granulose, a row of distinct dark punctures on base. Pattern of pubescence with setae subparallel, those on the anterior half of pronotum directed anteriorly and those on posterior half directed posteriorly in a narrow median strip, lateral setae with anterior half directed antero-laterally and posterior half directed postero-laterally. Scutellum more or less octagonal. Hypomera feebly inflexed, entirely visible in lateral aspect. Mesocoxal cavities narrowly separated; mesosternal process acute. Metasternum longer than width of mesocoxa. Tarsal formula 4-5-5, internal circular sclerites present at base of metasternum; anterior and middle tibiae with distinct row of spines.

ELYTRA. $\approx 1.2-1.3$ times as long as pronotum; very slightly sinuate apicolaterally, longer laterally than medially, carina present on anterior medial edge of elytra; microsetae numerous, uniformly distributed, directed more or less posteriorly; macrosetae absent; integument granulose. Hind wings present.

ABDOMEN. General shape broad at base, sides uniformly converging to broadly rounded apex. Tergites III-VIII with distinct macrosetae. Tergites III-VI moderately impressed at base, ante-

rior margin of tergites III-VI deeply and broadly V-shaped. Tergite VIII with 4 or 7 pairs of macrosetae. Tergite X with seta numerous, 3-4 major setae distinct; posterior margin not well sclerotized.

AEDEAGUS. Median lobe (Figs. 7 and 10). Paramere (Figs. 8 and 11).

SPERMATHECA. (Figs. 9 and 12).

SECONDARY SEXUAL CHARACTERISTICS. Male tergite VIII slightly sinuate.

Type species. *Tarphiota pallidipes* Casey [= *T. fucicola* (Mäklin)]. Designated by Casey (1910).

Distribution. From Alaska to California.

Biology. Members of the genus *Tarphiota* inhabit the mid to upper littoral zone of fine-grained sandy beaches, which is covered by only one or two high tides each month and contains decaying seaweed. Nothing is known of larvae or development of any species of *Tarphiota*.

Remarks. Casey (1893) described a new genus *Tarphiota* for *T. pallidipes* and mentioned that members of *Tarphiota* resembled *Alianta* Thomson, but differed from members of this latter genus by having spinulose tibiae. Fenyés (1918) placed *Tarphiota* in the tribe Myrmedoniini (group Athetae) based on the 4-5-5 tarsal formula, antennae with 11 antennomeres, maxillary palpi with 4 articles, and labial palpi with 3 articles. The tribal name Myrmedoniini was later synonymized under the name of Athetini by Seevers (1978). Bernhauer and Scheerpeltz (1926) classified the genus based on Casey's description and Fenyés' placement. Moore and Legner (1976) still placed *Tarphiota* in the Myrmedoniini (= Athetini). Seevers (1978) placed *Tarphiota* in the tribe Athetini with *Pontomalota* Casey but noted that these intertidal genera were not necessarily related to each other and other members of Athetini. Ahn (in press) hypothesized that members of *Tarphiota* were closely related to members of *Pontomalota* and *Thinusa* Casey and that these genera might form a monophyletic group within the tribe Athetini.

Key to the species of the genus *Tarphiota*

1. Body length 2.9-3.1 mm; abdominal tergite VIII with 7 pairs of macrosetae; spermatheca with narrow tube (Fig. 9); paramere as in Fig. 8 *T. fucicola*
- Body length 2.0-2.6 mm; abdominal tergite VIII with 4 pairs of macrosetae; spermatheca with broad tube (Fig. 12); paramere as in Fig. 11 *T. geniculata*

Tarphiota fucicola (Mäklin)

Tachyusa fucicola Mäklin, 1852: 306; Bland, 1865: 406.

Homalota fucicola (Mäklin), 1853: 182.

Tarphiota fucicola Casey, 1893: 333; Bernhauer and Scheerpeltz, 1926: 596; Hatch, 1957: 145;

Moore and Legner, 1975: 489; Lohse and Smetana, 1985: 286.

Tarphiota debilicollis Casey, 1910: 75. synonymy by Fenyés 1920.

Tarphiota pallidipes Casey, 1893: 333; Fenyés, 1920: 254. NEW SYNONYM

Description. Length 2.9-3.1 mm. Body color black, legs brown. Head = 1.2 times as wide as long, integument granulose, microsculpture more or less hexagonal. Labrum transverse. Epipharynx

(Fig. 3) with ≈ 8 lateral pores on each side. Labium (Fig. 6) with ≈ 12 -13 medial pseudopores and ≈ 11 -12 lateral pseudopores. Pronotum ≈ 1.3 times as wide as long, integument granulose; sides round. Mesosternal process narrow, acute. Elytra ≈ 1.3 times as long as pronotum, integument granulose. Abdominal tergites with microsetae more or less uniformly distributed, several macrosetae present.

Aedeagus. Median lobe as in Fig. 7. Paramere as in Fig. 8.

Spermatheca. Tube narrow (Fig. 9).

Type series. *Tachyusa fucicola* Mäklin, Lectotype designated by Lohse and Smetana in 1985.

Tarphiota debilicollis Casey: Lectotype, here designated, in the collection of the NMNH, with label as follows: "Casey bequest 1925; Lectotype, *Tarphiota debilicollis* Casey, Desig. K. J. Ahn, 1994".

Tarphiota pallidipes Casey: Lectotype, here designated, in the collection of the NMNH, with label as follows: "Casey bequest 1925; Lectotype, *Tarphiota pallidipes* Casey, Desig. K. J. Ahn, 1994". Paralectotypes, 8, same data as lectotype.

Material Examined. CANADA: British Columbia, Queen Charlotte Isl., Lepas Bay, Graham Island, 15 July 1988, J. S. Ashe, ex under rotting seaweed on beach (13, KSEM); Sidney (5, CAS); Victoria, Vanc., Hubbard & Schwarz (1, NMNH), Wickham (1, CAS). UNITED STATES: Alaska: Glacier Bay, Unalaska, Van Dyke, 5 July 1907 (8, CAS); Nazan Bay, Atka Aleutian Is., 31 July 1907, V. Dyke (6, CAS), 1 Aug. 1907 (8, CAS). California: Marin Co.: Point Reyes, North Beach, 15 May 1991, K. J. Ahn & J. S. Ashe, ex under seaweed (1, KSEM); Stinson Beach, 14 May 1991, K. J. Ahn & J. S. Ashe, ex under seaweed on beach (17, KSEM); San Francisco Co.: San Francisco, 1 May 1910, F. E. Blaisdell (1, CAS), 27 May 1908 (1, CAS), 24 Nov. 1907 (1, CAS), 24 Nov. 1918, E. P. Van Duzee (1, CAS); Long Beach, 28 Oct. 1916, J. O. Martin (4, CAS); San Mateo Co.: Pacific Beach, 16 May 1991, K. J. Ahn & J. S. Ashe, ex under seaweed on sand beach (4, KSEM); Montara Beach, 16 May 1991, K. J. Ahn & J. S. Ashe, ex under seaweed on sand beach (32, KSEM); Pomponio St. Beach, 5 June 1991, K. J. Ahn, ex under seaweed (6, KSEM); Halfmoon Bay St. Beach, 16 May, K. J. Ahn & J. S. Ashe, ex under seaweed on sand beach (6, KSEM); Moss Beach, 12 May 1910, F. E. Blaisdell (2, CAS), May 1910 (1, CAS); Santa Cruz Co.: Aptos, 19 Nov. 1932, F. E. Blaisdell (2, CAS); Humboldt Co.: Prairie Creek Redwoods St. Park, Gold Bluff Beach, 24 July 1975, V. F. Lee (1, CAS); Monterey Co.: Zmudowski St. Beach, 20 May 1991, K. J. Ahn, ex under seaweed (3, KSEM); Salinas River St. Beach, 20 May 1991, K. J. Ahn, ex under seaweed (43, KSEM); Carmel, 8 Sept. 1920, F. E. Blaisdell (4, CAS), 24 March 1919, E. P. Van Duzee (4, CAS); San Luis Obispo Co.: Cayucos St. Beach, 22 May 1991, K. J. Ahn, ex under seaweed (1, KSEM); Santa Barbara Co.: Santa Barbara, Hubbard & Schwarz (1, NMNH); Pt. Sal St. Beach, 3 June 1991, K. J. Ahn, ex under seaweed (2, KSEM); San Miguel Isl., 20 June 1910, V. W. Owen (2, CAS); Los Angeles Co.: Los Angeles, April, Chittenden (1, NMNH), Aug. (2, NMNH), July (1, NMNH), 17 June 1937 (2, NMNH), 11 March 1934 (1, NMNH); Santa Monica, March, A. Fenyes (2, CAS); Redondo, March, A. Fenyes (4, CAS), 4 June 1904, A. Fenyes (1, CAS); San Diego Co.: San Diego, 20 Aug. 1917, J. O. Martin (1, CAS); Port Watsonville, Cal, 26 Nov. 1932, F. E. Blaisdell (3, CAS); Cal, Hubbard & Schwarz (1, NMNH); Cal (4, NMNH); Del Monte, 7 June 1904, A. Fenyes (2, CAS).

Distribution. From Alaska to California.

Synonymy. I have examined Casey's syntypes of *Tarphiota pallidipes*. I could not find sufficient characters to separate *Tarphiota pallidipes* from *T.*

fucicola. Leg coloration, which was previously used to distinguish *T. pallidipes* from *T. fucicola* by Casey (1893), is not a reliable distinguishing characteristic.

Tarphiota geniculata (Mäklin)

Homalota geniculata Mäklin, 1852: 308; Bland, 1865: 404.

Tarphiota geniculata (Mäklin), 1893: 334; Bernhauer and Scheerpeltz, 1926: 596; Hatch, 1957: 145; Moore and Legner, 1975: 489; Lohse and Smetana, 1985: 291.

Tarphiota hirsutula Casey, 1910: 75. synonymy by Fenyes 1920.

Tarphiota iota Casey, 1910: 76. synonymy by Fenyes 1920.

Tarphiota insolita Casey, 1910: 76. synonymy by Fenyes 1920.

Tarphiota litorina Casey, 1910: 75. synonymy by Fenyes 1920.

Tarphiota seditiosa Casey, 1910: 76. synonymy by Fenyes 1920.

Description: Length 2.0-2.6 mm. Body color entirely black. Head \approx 1.2 times as wide as long, integument granulose, microsculpture more or less hexagonal. Labrum very transverse. Epipharynx with \approx 6 lateral pores on each side. Labium with \approx 5 medial pseudopores and \approx 3 lateral pseudopores. Pronotum \approx 1.2 times as wide as long, integument granulose; apical line straight, basal line very slightly sinuate, sides round. Mesosternal process acute. Elytra \approx 1.2 times as long as pronotum, integument granulose. Abdominal tergites with microsetae more or less uniformly distributed, macrosetae not distinct.

Aedeagus. Median lobe as in Fig. 10. Paramere as in Fig. 11.

Spermatheca. Tube broad (Fig. 12).

Type series. *Homalota geniculata* Mäklin, Lectotype designated by Lohse and Smetana in 1985.

Tarphiota hirsutula Casey: Lectotype, here designated, in the collection of the NMNH, with label as follows: "Cal, Casey bequest 1925; Lectotype, *Tarphiota hirsutula* Casey, Desig. K. J. Ahn, 1995".

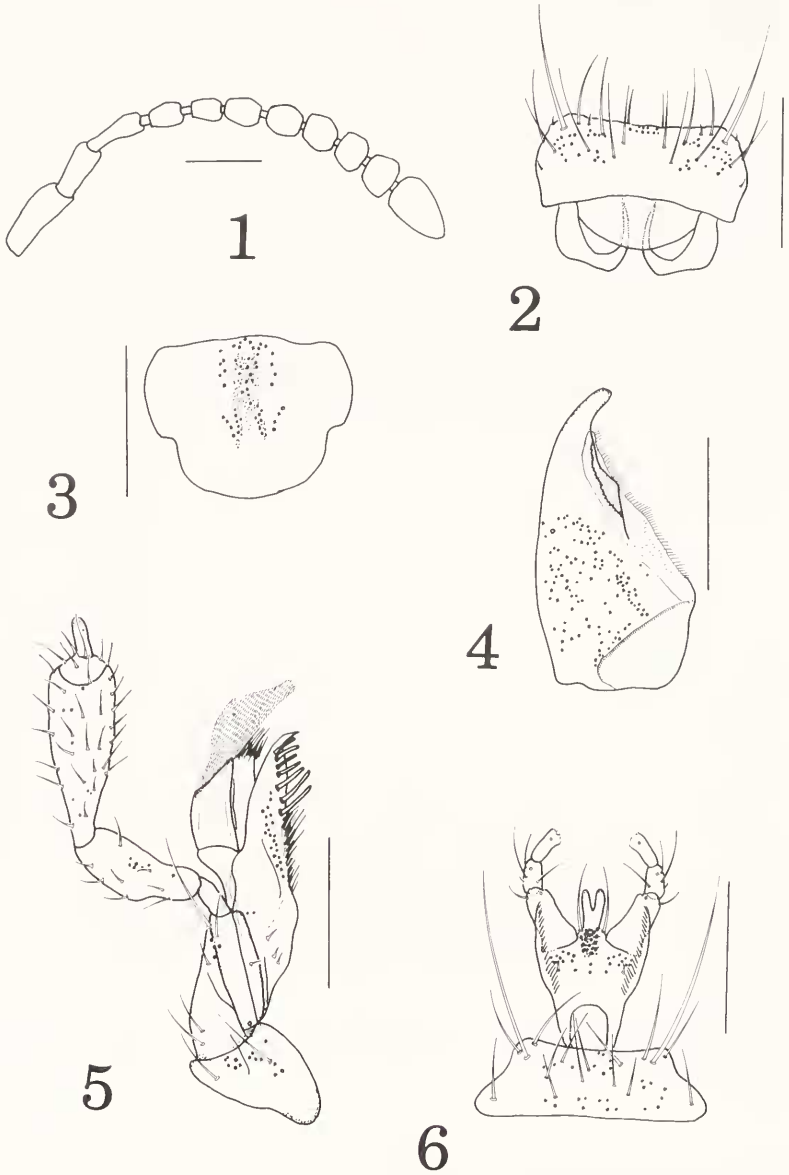
Tarphiota iota Casey: Lectotype, here designated, in the collection of the NMNH, with label as follows: "Cal, Casey bequest 1925; Lectotype, *Tarphiota iota* Casey, Desig. K. J. Ahn, 1995". Paralectotype, 1, same data as lectotype.

Tarphiota insolita Casey: Lectotype, here designated, in the collection of the NMNH, with label as follows: "Casey bequest 1925; Lectotype, *Tarphiota insolita* Casey, Desig. K. J. Ahn, 1995".

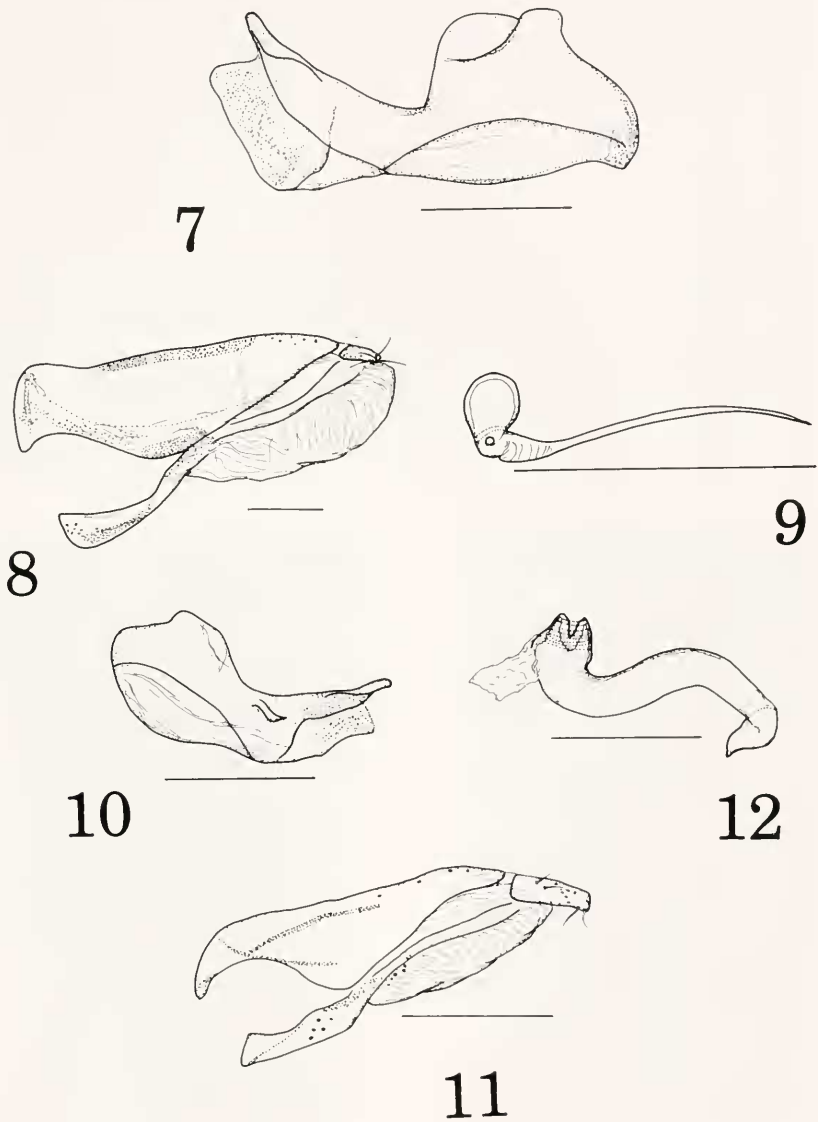
Tarphiota litorina Casey: Lectotype, here designated, in the collection of the NMNH, with label as follows: "Cal, Casey bequest 1925; Lectotype, *Tarphiota litorina* Casey, Desig. K. J. Ahn, 1995". Paralectotypes, 2, same data as lectotype.

Tarphiota seditiosa Casey: Lectotype, here designated, in the collection of the NMNH, with label as follows: "Casey bequest 1925; Lectotype, *Tarphiota seditiosa* Casey, Desig. K. J. Ahn, 1995". Paralectotype, 1, same data as lectotype.

Material Examined. CANADA: British Columbia, Queen Charlotte Isl., Lepas Bay, Graham Island, 15 July 1988, J. S. Ashe, ex under rotting seaweed on beach (35, KSEM); Massett, no date, Rev. Keen (2, CAS); Sidney, no date, A. Fenyes (1, CAS). UNITED STATES: Alaska: Nazan Bay,



Figs. 1-6. *T. fucicola* (Mäklin). 1, Antenna, dorsal aspect; 2, labrum, dorsal aspect; 3, epipharynx, dorsal aspect; 4, right mandible, ventral aspect; 5, maxilla, dorsal aspect. 6, labium, dorsal aspect. Scale, 0.1 mm.



Figs. 7-12. *T. fucicola* (Mäklin), 7-9 and *T. geniculata* (Mäklin), 10-12. 7, Median lobe, lateral aspect; 8, paramere, lateral aspect; 9, spermatheca, dorsal aspect; 10, median lobe, lateral aspect; 11, paramere, lateral aspect; 12, spermatheca, dorsal aspect. Scale, 0.1 mm.

Atka Aleutian Isl., 1 Aug. 1907, Van Dyke (3, CAS). Oregon: Lincoln Co.: 5.0mi. S. Waldport, 26 Aug. 1986, J. S. Ashe, ex running on wave swept shore (5, KSEM); 4.0mi. N. Yachts hwy 101, 27 Aug. 1986, J. S. Ashe, ex on sand beach (39, KSEM). California: Humboldt Co.: Prairie Creek Redwood St. Park, Gold Bluff Beach, 24 July 1975, V. F. Lee (6, CAS); Marin Co.: Bolinas Point, 1.6mi. due west of Bolinas, 16 June 1974, V. F. Lee (8, CAS), 20 April 1975 (7, CAS), 9 June 1974 (2, CAS); Bolinas Point, 2 June 1974, V. F. Lee (4, CAS); Stinson Beach, 14 May 1991, K. J. Ahn & J. S. Ashe, ex under seaweed on sand beach (2, KSEM); Point Reyes, North Beach, 14 May 1991, K. J. Ahn & J. S. Ashe, ex under seaweed (1, KSEM); Point Reyes, Nat. Seashore Wildcat Beach, 1 June 1975, V. F. Lee (2, CAS); San Francisco Co.: San Francisco, no date, F. E. Blaisdell (4, NMNH), Aug. (16, CAS), July (2, CAS), 9 Sept. 1909 (1, CAS), 27 May 1908 (1, CAS), 24 Nov. 1907 (4, CAS), May (1, CAS), 6 Aug., Wickham (4, CAS), 1 Aug. (2, CAS); San Mateo Co.: Halfmoon Bay St. Beach, 16 May 1991, K. J. Ahn & J. S. Ashe, ex under seaweed (10, KSEM); Montara Beach, 16 May 1991, K. J. Ahn & J. S. Ashe, ex under seaweed on sand beach (1, KSEM); Pomponio St. Beach, 5 June 1991, K. J. Ahn, ex under seaweed (12, KSEM); Monterey Co.: Asilomar St. Beach, 20 May 1991, K. J. Ahn, ex under seaweed (10, KSEM); Asilomar Beach, 31 March 1968, J. B. Evans, ex under wet seaweed (1, KSEM); Salinas River St. Beach, 20 May 1991, K. J. Ahn, ex under seaweed; Zmudowski St. Beach, 20 May 1991, K. J. Ahn, ex under seaweed (41, KSEM); Carmel, 24 March 1919, E. P. Van Duzee (1, CAS), 8 Sept. 1920, F. E. Blaisdell (8, CAS); San Luis Obispo Co.: Pismo St. Beach, 2 June 1991, K. J. Ahn, ex under seaweed on sand beach (4, KSEM); Cayucos St. Beach, 22 May 1991, K. J. Ahn, ex under seaweed (23, KSEM); Morro Strand St. Beach, 22 May 1991, K. J. Ahn, ex under seaweed (8, KSEM); Santa Barbara Co.: Santa Barbara, 16 June 1931, F. E. Blaisdell (1, CAS); Pt. Sal St. Beach, 3 June 1991, K. J. Ahn, ex under seaweed (42, KSEM); Carpinteria St. Beach, 23 May 1991, K. J. Ahn, ex under seaweed (4, KSEM);



Figs. 13-14. 13, *Tarphiota fucicola* (Mäklin), habitus. Length: 3.0 mm; 14, *Tarphiota geniculata* (Mäklin), habitus. Length: 2.4 mm.

San Miguel Isl., 20 June 1910, V. W. Owen (2, CAS); Ventura Co.: San Buenaventura St. Beach, 23 May 1991, K. J. Ahn, ex under seaweed (5, KSEM); Los Angeles Co.: Long Beach, 28 Oct. 1916, J. O. Martin (3, CAS); Redondo, March, A. Fenyes (3, CAS), April (1, CAS), July (1, CAS); S. Pedro, Aug. (2, KSEM): Cal (3, NMNH); San Diego Co.: San Diego, Hubbard & Schwarz (1, NMNH), 20 Aug. 1917, J. O. Martin (8, CAS), 22 Nov. 1890, F. E. Blaisdell (5, CAS), 19 Jan. 1928 (4, CAS), no date (2, CAS), no date, Wickham (1, CAS); Silver Strand St. Beach, 28 May 1991, K. J. Ahn, ex under seaweed (8, KSEM); Del Monte, June, A. Fenyes (2, CAS); Casey bequest 1925 (6, NMNH).

Distribution. From Alaska to California.

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